To wake in fright

Most episodes of awareness under anaesthesia are due to faulty apparatus or technique

When ether was introduced in the 1840s as an anaesthetic many of the original patients were pain free but not unconscious. Further developments led to the recognition of a need for a concentration of anaesthetic in the brain that produced both analgesia and unconsciousness. Such a state (Guedel stage III) was invariably in use until neuromuscular blocking drugs were introduced 50 years ago.

Since then it has become fashionable to reduce the inhaled concentration of gaseous and volatile anaesthetics to minimise their other effects and to produce relaxation for surgery by neuromuscular blockade. Such “balanced anaesthesia” has led to the problem of patients being aware of what is happening when they expected to be unconscious. The range of awareness varies from being pain free but able to recall snatches of conversation or other events during the operation to being fully awake, in intense pain and unable, because of paralysis, to communicate with anyone.1, 2

How common is it? Liu and his colleagues talked to 1000 patients who had undergone general anaesthesia and found two patients who recalled something about their anaesthetic.3 In both, the dose and concentrations of anaesthetic agents were probably too low. From their review of some 3000 general anaesthetics for caesarean section Lyons and MacDonald calculated that the incidence of awareness was 1:75 when the dose of thiopentone was restricted to 4 mg/kg and the inhaled gas concentrations to 50% nitrous oxide and 0-5% halothane.4 More recently, with the induction dose of thiopentone increased to between 5 and 7 mg/kg and isoflurane (1%) replacing halothane, the incidence of awareness fell to 1:238. Increasing the concentration of inspired anaesthetic gas therefore reduces the risk of awareness. As Scott has pointed out the effects of volatile anaesthetics on the fetus are small; if necessary they can be eliminated with normal methods of resuscitation.

Reviewing the records of the Medical Defence Union, Hargrove found that most episodes of awareness could be attributed either to faulty technique (70%) or to failure of apparatus (20%),5 which routine preoperative checks should detect. Awareness under general anaesthesia should not happen if sufficient brain concentrations are reached, although some patients will require much higher than average doses of anaesthetic drugs to achieve this.

Conventional clinical signs alone may not be enough to indicate that the depth of anaesthesia is too low especially in a paralysed patient. In the past decade a reassessment of Tunstall’s technique for detecting wakefulness during general anaesthesia6 has shown poor correlation with light general anaesthesia7 and a poor predictive value for recall and dreaming.8 Electroencephalography is of doubtful value in predicting or detecting awareness. There is at best only circumstantial evidence of a correlation between electroencephalographic activity and higher brain functions such as awareness and vigilance.9 Mori has suggested that the rates of spontaneous or evoked contractions of the lower oesophageal sphincter are more readily assessed indices of depth.10 The results look promising with volatile anaesthetic agents but are unreliable with opioids.11

Another problem to add to those of awareness and pain is “unconscious recall”, which implies that traumatic events leave traces in the cerebral cortex. These are not accessible to conscious recall but might be chronic psychiatric problems leading to a post-traumatic neurosis syndrome.12 Under hypnosis some patients have recalled sham suggestions of disasters made during anaesthesia,13 but another study found that benign suggestions were not recalled.14 Other studies reported that positive suggestions during anaesthesia and surgery had conflicting effects on improving postoperative recovery.

Studies of evoked auditory potentials show that anaesthesia delays but does not abolish transmission through the brain stem and cortex.15 Playing random noise through the ears of patients undergoing intravenous anaesthesia for bronchoscopy reduces the incidence of dreaming.16 The inference is that blocking out other auditory stimuli increases the threshold for awareness. Some benefit may accrue from using headphones to play either random noise or music to block other auditory input during anaesthesia.

How can awareness during general anaesthesia be prevented? Recommendations include premedicating patients with sedative or amnesic drugs and using sufficient doses of intravenous induction agents, using effective analgesic techniques during surgery, and, especially, adequate inspired anaesthetic gas concentrations.17 The inhaled concentrations can readily be measured. Depending solely on intravenous techniques does not avoid and could exacerbate the problem.

Anaesthetists should remember those periods when awareness is more commonly described. These include the time of tracheal intubation, that during transfer from the anaesthetic room to the theatre, and at any time when life is threatened and the anaesthetist uses no anaesthetic gas at all. Nearly half the patients treated for life threatening trauma could recall some intraoperative events, although at the start of surgery they were both unconscious and profoundly shocked.18 Despite all measures there is no certain way to avoid awareness in paralysed patients. Even patients given lorazepam or opioids may have some recall.19

Anaesthetists should be alert to the possibility that patients may be aware. Should any patient complain, the complaint must be taken seriously. Failure to do so may itself be an important cause of post-traumatic neurosis and may increase the likelihood of litigation.20 During the routine postoperative visit a structured interview allows recall or dreaming to be detected, and appropriate counselling should be offered. Patients thought to be at increased risk of awareness (obstetric patients, those undergoing cardiopulmonary bypass, and “poor risk” patients) should be forewarned of the possibility. They should also know that adequate analgesia may be guaranteed.

As with so many aspects of the actions of anaesthetic drugs on the brain, we still need a reliable monitor of awareness. Even if one was available the anaesthetist should continue to take note of any clinical signs and remain vigilant.

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Adverse drug reactions and secrecy

Knowledge is power; doctors should cede some of both to their patients

All of us are exposed to risk. Some risks we choose, others are unavoidable. For example, we must eat to live, and most of us consume some 3000 “natural” chemicals each day in our diet. Taking medicine constitutes a further risk, but few people are sufficiently well informed to choose which drugs they will take. Instead, they delegate this responsibility to an informed proxy, the doctor.

Traditionally, doctors have told their patients little about possible unwanted effects of prescribed medicines. Two British studies have shown that only a quarter of patients knew what side effects their medicines could cause,1-4 and half of these “informed” patients became aware of problems only when they themselves were affected.

For many drugs the risks may be small compared with the likely benefits. Unexpected adverse reactions, however, may leave patients worse off than before they took the medicine.1 Unsurprisingly, drug risks constitute a major topic of public concern, which has been fuelled by the withdrawal of several newly introduced medicines, including benoxaprofen and zomepirac, and modified indications for others, such as flecainide and xamoterol. In addition, several older, established medicines, such as triazolam (Halcion) and tryptophan, have been withdrawn.

Although unwanted events are thought of in terms of the direct harm they cause to the victims,1 their impact extends to those responsible for manufacturing and licensing drugs.1 Two recent reports have examined the public’s concern about drug regulation and identified shortcomings in how we deal with the problems.16

In Pharmaceuticals: A Consumer Prescription the National Consumer Council makes a plea for greater openness with the public. It asserts that when things go wrong what many people and their relatives want is an explanation of what has happened, why it happened, and an assurance that it will never happen again. Both the National Consumer Council and Medawar’s (who describes the origins and working of our regulatory system and gives a detailed history of the problems relating to sedative-hypnotic drugs) point out that our Medicines Act prohibits the disclosure of information considered by expert advisory committees. Consequently, the basis of decisions taken by the Committee on Safety of Medicines is secret. By contrast, the United States has a transparent national drugs policy, which seems far preferable, even if it means repealing section 118 of the Medicines Act. (This restricts disclosure of information obtained under the act.)

Careful thought is needed about how much information should be made available. Previous submissions to the Committee on Safety of Medicines have run to many volumes of data (the record exceeds 120). Furthermore, some information, such as high dose toxicity studies, requires expert interpretation. A sensible compromise would be to release the formal assessment made by the Medicines Control Agency. Access to this information would be invaluable to those of us who teach clinical pharmacology and therapeutics. These two moves would do much to allay the understandable concerns raised by the public. A further suggestion is that proceedings should be open to the public; objections are likely to be raised to this proposal even though few people would probably attend.

In addition to these changes, the National Consumer Council considers that patients should play a more active part in decisions about their treatment. It wants patients made more fully aware of the available options and the risks of taking medicine. Requests of this type are by no means confined to the United Kingdom, and some governments are beginning to respond. Recently the United States government and its Food and Drugs Administration have reinforced the need to provide the public with better information about medicines. Furthermore, substantial progress has occurred in the United Kingdom with the development of printed information (package inserts). We still have some way to go, however, before all medicines are dispensed in patient packs and consumers can be assured of receiving printed information.

Most people probably do not want to know all of the risks entailed, and doubts exist over whether many of them have sufficient understanding of medical benefit and risk (or that doctors could explain these) to make truly informed decisions. Nevertheless, the National Consumer Council’s document is intended to stimulate discussion and “to move things forward.” I believe that it will succeed in both of these aims.

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